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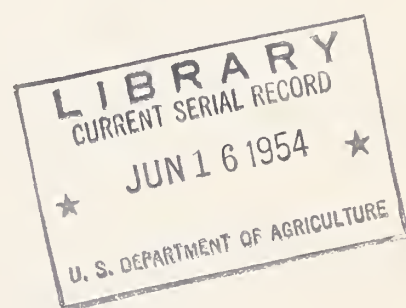


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MISCELLANEOUS REPORT NO. 29

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UNITED STATES DEPARTMENT OF AGRICULTURE
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SOME THOUGHTS ON FOREST FIRE DAMAGE APPRAISAL

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Damage appraisal is an involved and controversial subject about which there has been some confused thinking. This is especially true in the case of damage resulting from forest fires. The definition of fire damage given in the Forest Service Glossary, "The value *** of the loss *** caused by fire," is simple enough. The trouble lies in its interpretation and in the fact that damage and loss are not necessarily the same.

On one hand, some hold to the common law interpretation that damage is the difference in market value before and after a fire. Others contend that damage should include the depreciation in all values--direct, indirect, tangible, and intangible--resulting from burning. Some would even go so far as to include speculative values (assumed future stumpage prices and the anticipated return on the amount invested, for example) and such intangibles as economic, social, and aesthetic values. Another school of thought maintains that cost, or the investment involved, is the proper basis of damage, while still others hold out for the cost of replacement.

There is no simple answer to the question as to what constitutes fire damage. All of the proposals made have something to be said for them but none are wholly satisfactory. The difficulty is that objectives differ and that the formula which serves the purpose of one group fails to meet the needs of another.

The defendant in a case of fire trespass, for example, wants to keep damage as low as possible. The injured party, on the other hand, wants all that he can get in the way of compensation. In such cases, the amount of damage allowed usually depends on who has the best lawyer.

The advocates of bigger and better fire protection and the sensation-minded call for maximum damage figures; while fire-control organizations, which want to show how good a job they are doing, and parties interested primarily in keeping expenditures down, favor minimum damage estimates. Neither extreme can be wholly justified and both, if overdone, tend to defeat their purpose.

For statistical purposes, damage estimates should be objective and as free from bias as possible. To be of value as a record, they must be consistent and dependable. To have wide acceptance they must also be realistic, that is to say they must be based on elements and methods generally understood and accepted. Unfortunately estimates of forest-fire damage frequently fail

¹/ Maintained at St. Paul 1, Minnesota by the Forest Service, U.S. Department of Agriculture, in cooperation with the University of Minnesota

to meet these requirements. As a result, damage figures are the least useful and satisfactory of all forest-fire statistics. The only hope for consistent and generally acceptable damage statistics lies in agreement, by common consent, on the specific items to be considered and the method of appraisal to be used.

For practical considerations, damage estimates for statistical purposes should be limited to items that are generally recognized and can be satisfactorily evaluated. If estimates of other items are made, they should be segregated so as not to confuse the record. Suppression costs should also be reported separately for, while a legitimate item of loss, they do not represent damage.

The distinction between loss and damage is often overlooked in the case of forest fire-damage appraisal. For example: two tracts of timber costing the same per acre are destroyed by fire. One was well stocked, the other poorly stocked. While the loss sustained in each case was the same, no one could argue that this was true of damage. Another case: a man spends a thousand dollars on a piece of timber or other property. If it is destroyed by fire he loses his thousand dollars. The damage to the property chargeable to the fire, however, may be more or less, depending on the value of the property at the time it was destroyed. In either case the real value or present worth of the property destroyed, not its cost, is the proper criterion of damage. Where cost exceeds value the difference is chargeable to poor investment, not to damage, since it represents a loss that would have been sustained regardless of whether the property burned or not. Strictly speaking, loss is measured by cost, damage by the value of the property destroyed. Recognition of this basic principle, in the appraisal of fire damage, would eliminate most of the present confusion and inconsistencies in fire-damage statistics. Its application to the various items of damage, however, also calls for standardization.

In the case of merchantable timber, the market value of the stand before burning, with due allowance for any actual salvage, is generally accepted as the measure of damage sustained. If not reasonably accessible, allowance may be made for development costs, either by discounting the prevailing market price of comparable accessible timber, or by using established minimum stumpage rates.

The valuation of young growth presents more of a problem since young growth as a rule has no current market value. Damage in such cases, is usually based on arbitrary token values, cost or cost of replacement, expectation value, or on calculated present worth. While token values recognize that damage results when young growth burns, they have little statistical value and are only justified as a temporary expedient pending the development of a sounder method of damage appraisal. Cost and cost of replacement figures express loss not damage, as already pointed out, and result in values inconsistent with the value recognized in the case of merchantable timber. Expectation value represents future, not present worth, hence does not reflect present loss. Present worth, or expectation value discounted to the current age of the stand, on the other hand, provides a sound and consistent estimate of damage sustained.

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The latter method has been in use in the Lake States, by both State and Federal protection agencies, since 1938. To simplify the computation required, a table was prepared showing the present worth of young stands at average prevailing stumpage rates, for each major forest type, site, size class, density of stocking, and severity of burn. Recently this table has been modified to permit the use of current local stumpage prices. This better reflects local market conditions and makes frequent revisions, because of changing stumpage rates, unnecessary.

At the 1938 Lake States Fire Damage Conference it was agreed by the agencies represented that for statistical purposes fire damage to plantations should be evaluated in the same manner as comparable natural stands. This is logical since their yield value, hence their present worth, is the same. To base damage on cost or cost of replacement, not only assumes that the value of the timber produced is determined by its cost of production, which at present at least is not the case, but bases damage on future rather than present value. Any such valuation is purely speculative and does not give a true picture of the damage actually sustained.

The soundness of considering protection costs in evaluating fire damage, as advocated by the Forest Service,^{2/} is also open to question since such expenditures add nothing to the values involved. Like fire insurance, protection is simply a hedge against loss, not a capital investment. A building is worth no more because it is insured. Neither is timber more valuable because it is protected from fire. The risk or chance of loss may be currently reduced, but neither fire insurance or protection expenditures have any cumulative or permanent value. Neither should planting or seeding costs be included as an item of damage^{3/} since they have nothing to do with the values destroyed.

The value of forage and other minor forest products, such as ferns, pine "straw", etc., depends on the demand for or use made of them. Where such items have a recognized commercial or use value, this is usually taken as the basis for damage when they are destroyed by fire. If they have no such value, no damage should be reported.

Destruction or depreciation in value of improvements, equipment, materials, supplies, cut forest products, farm crops, and other property by forest fires is properly reported under "other damage." In such cases damage is usually based on the depreciation in market value of the items in question; or in the case of improvements and equipment, on cost or cost of replacement depreciated, by age or service, to present worth.

Intangible losses (silvicultural, watershed, recreation, wildlife, economic, social, and aesthetic, for example) are legitimate items of damage and should be considered. Such items, however, should be segregated from the recognized tangible items in order to avoid confusion and misunderstanding in the interpretation of forest-fire statistics. While progress has been made

^{2/} National Forest Handbook, Vol. III, Title 6, 703.2 b (3,4, and 6)

^{3/} National Forest Handbook, Vol. III, Title 6, 703.2 b (4 and 6)

in evaluating some of these intangibles, satisfactory methods of damage appraisal have not yet been developed, in most cases, because the necessary basic information is not available. Arbitrary token values, now used in some cases, serve to call attention to this type of damage but are of little statistical value. Damage estimates based on cost of protection are even less satisfactory since such costs have no relation to the value involved. Sound and acceptable methods of evaluating the so-called intangible items of damage are urgently needed since such losses may be more important than tangible damage and often are the chief justification for public fire-control effort.

Summary

(1) For statistical purposes, fire-damage estimates should be based on depreciation in present worth.

(2) Tangible and intangible items of damage should be segregated.

(3) Agreement is needed as to the items considered! The following are suggested:

Timber (standing)
 Merchantable
 Young growth

Other
 Forage
 Improvements
 Equipment
 Cut forest products
 Miscellaneous (supplies, materials, crops, etc.)

Intangible values
 Silvicultural (site, soil, productivity, etc.)
 Watershed
 Recreation
 Wildlife
 Economic

(4) Methods of damage appraisal should be standardized.

(5) Plantations should be appraised the same as comparable natural stands.

(6) Damage estimates should not be based on or include seeding, planting, protection, or suppression costs.

(7) Delayed or inhibited reproduction and damage to site and to the protection value of cover should be charged to silvicultural and watershed damage, not to the present timber crop.

(8) Sound and realistic methods for the evaluation of so-called intangible damage are essential.

